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CLASS XI MATHEMATICS LITERACY ABILITY PROFILE OF SMK NEGERI 1 TANJUNG PANDAN

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Abstract

This work aims to identify and analyze the mathematical literacy abilities of class XI students at SMK Negeri 1 Tanjung Pandan. The method used is a survey and analysis of student learning outcomes through tests and questionnaires. The research results show that students' understanding of basic concepts, problem solving abilities and metastatic communication skills still need to be improved. It is hoped that this research can provide input for the development of curriculum and teaching methods in schools. The implementation method used consists of several stages, the subject of observation is the results of the class AKM Pre-Test, the data collection technique used is observation, and other sources that are considered capable of developing research. At SMK Negeri 1 Tanjung Pandan, mathematical literacy is one of the focuses of learning to prepare students to enter the world of work. This research aims to evaluate the level of mathematical literacy of class XI students and identify areas that need improvement. The mathematical literacy abilities of class Further efforts are needed to improve conceptual understanding, problem solving abilities, and mathematical communication skills. Of the 3 0% scores, improvement is required by repeating the material, as well as creating a Post-Test to measure changes in the mathematical literacy abilities of class XI TKJ 1 SMK Negeri 1 Tanjung Pandan students.

Keywords: literasi; pre-test; matematics

1. Introduction

It can be said that Indonesian students' mathematical literacy abilities have not developed optimally. This mathematical literacy ability can be seen from the results of assessments carried out by the International Program for Student Assessment (PISA) which is carried out every three years. Indonesia has participated in the PISA assessment since 2000. Unfortunately, the results of the PISA assessment for Indonesian students so far have not shown satisfactory results. According to PG Dikdas, one of the aspects assessed by PISA is mathematical literacy (Sulasdini & Himmah, 2021)

In the current digital era, students' numeracy literacy is one of the important skills that must be mastered to face global challenges. However, students' numeracy literacy level is still relatively low. Numeracy literacy includes the ability to apply mathematical concepts in everyday life, including understanding, analyzing and utilizing numeracy information. This low numeracy literacy ability has an impact on students' low mathematics achievement and problem solving abilities.(Aziz & Zakir, 2022) This is increasingly becoming a concern, considering the global education trend which focuses on developing 21st century competencies, where numeracy literacy has a very significant role. Integration of numeracy literacy in 21st century mathematics learning is very important to prepare students to face complex challenges in everyday life.(Ke- & Tania, 2024)

Mathematics comes from the Greek word "mathematice" which means "study" and from the word mathema which means "knowledge" or "knowledge". Mathematics is a thinking concept that has been studied for years and is taught at all levels of formal education, from elementary school, junior high school, high school to college. Mathematics plays a very big role in everyday life, so mathematics is closely related to human life. (Wati, 2021).

Mathematical literacy is an essential ability that students must have, especially in preparing them to face challenges in the world of work and higher education. At SMKN 1 Tanjung Pandan, the results of the Minimum Competency Assessment Pre-Test (AKM) for class When carrying out the Pre-Test, class.

Mathematical literacy is an essential skill that students must have, especially in preparing them to face challenges in the world of work and higher education. At SMKN 1 Tanjung Pandan, the results of the Pre-Test Minimum Competency Assessment (AKM) for grade XI showed a concerning phenomenon, especially with a score of 0% on the topics of three-variable equation systems, exponential functions, and expansions. Grade XI TKJ 1 students tended to have difficulty in 3 discussion topics when taking the Pre-Test because one of the methods had been forgotten because they got it in one of the materials in junior high school or even in grade X. This article will analyze the profile of grade XI students' mathematical literacy abilities and investigate the factors that contribute to these low results.

The research method used is a qualitative method. The data collection technique used is observation, and other sources that are considered capable of developing research. The data obtained are then concluded from data reduction and display. The results of this study explain that the literacy carried out by students in answering mathematical story problems and being able to work on problems with mathematical formulas.

The AKM class pre-test from this campus teaching program got slightly less than satisfactory results, out of 20 math questions and consisting of story-based questions, only 17 questions had a percentage that was not 0%, the following are the percentage results from the 3 that had 0% result.

Theoretical Framework

Students of SMKN 1 Tanjung Pandan are students from various schools, and it is possible that they also use a different curriculum from their previous school, using the wrong formula or even forgetting the formula can be one of the factors that they cannot answer 3 questions with a percentage of 0%. Not reading the questions carefully can be the main factor in the error in answering the math questions.

In everyday life, it can also be a factor in lack of literacy in mathematics, one example of the use of mathematical literacy in everyday life is, when shopping at a store, we are often faced with several choices of goods. Some of them may have discounts or bonuses in the form of vouchers or others. By considering a more economical price, so that it can be more profitable. This shows that mathematical literacy is not only in mastering the material in class, but also in the use of

mathematical facts, concepts, and procedures in solving everyday problems, (Firdaus & Rustina, 2019) but the story questions listed in the Pre-Test questions are so long, so they have difficulty reading them and they also only read them briefly

Thus, it is important to train students' basic numeracy skills since elementary school to prepare the next generation of the nation in the future for the progress of the nation in an increasingly sophisticated era. One of the basic sciences that must be mastered to be able to compete in this technological era is mathematics. When someone is able to master numeracy knowledge well, then they are able to master mathematics (Wahyu Adinda et al., 2022).

Teachers play a very important role in preparing students to have reading and numeracy literacy skills. Therefore, teachers are highly demanded to be able to understand examples of Minimum Competency Assessment (AKM) questions in order to be able to guide students in understanding examples of AKM questions. (Asesmen & Pembelajaran Balitbang dan Perbukuan, 2021) Thus, based on the presentation of the test results and interviews conducted with students, it can be concluded that the numeracy skills of these students in solving geometry problems in AKM Numeracy are still relatively low. (Sari et al., 2021b).

Literature Review

Mathematical literacy is an essential skill that students must have, especially in preparing them to face challenges in the world of work and higher education. At SMKN 1 Tanjung Pandan, the results of the Pre-Test of Minimum Competency Assessment (AKM) for class XI showed a concerning phenomenon, especially with a score of 0% on the topic of three-variable equation systems, exponential functions, and expansions. Class XI TKJ 1 students tended to have difficulty in 3 discussion topics when taking the Pre-Test because one of the methods had been forgotten because they got it in one of the materials in junior high school or even in class X. This article will analyze the profile of mathematical literacy abilities of class XI students and investigate the factors that contribute to these low results.

The AKM class pre-test from this campus teaching program got slightly less than satisfactory results, out of 20 math questions and consisting of story-based questions, only 17 questions had a percentage that was not 0%, the following are the percentage results from 3 of which had a result of 0% so that improvement is needed material (system of linear equations of three variables, exponential functions and use of mean, median and mode in solving "expansion" problems).

2. Methods

The implementation method used consists of several stages. The subject of observation is the results of the class AKM Pre-Test. The data collection technique used in this study is monitoring the implementation of the Pre-Test and the results of the Class AKM Pre-Test. Interviews were conducted to obtain knowledge about mathematical literacy in class XI TKJ 1 at SMKN 1 Tanjung Pandan. The focus of the study in this study was on 30 class XI TKJ 1 students, this study analyzed how literacy

in mathematics by class XI TKJ 1 students in the implementation of the Class AKM Pre-Test.

The research method used is a qualitative method. The data collection technique used is observation, and other sources that are considered capable of developing research. The data obtained are then concluded from data reduction and presentation. The results of this study explain that the literacy carried out by students in answering mathematical story problems and being able to work on problems with mathematical formulas. The obstacles experienced by some students in answering questions, there are students whose literacy is lacking so that they only read a little of the question and answer with feeling rather than being calculated by the student. The methodology explains the design of the study, study samples, study instruments, data collection procedures, and data analysis methods, pilot studies, validity and reliability.

3. Results and Discussion

Students of SMKN 1 Tanjung Pandan are students from various schools, and it is possible that they also use a different curriculum from their previous school, using the wrong formula or even forgetting the formula can be one of the factors that they cannot answer 3 questions with a percentage of 0%. Not reading the questions carefully can be the main factor in the error in answering the math questions.

In everyday life, it can also be a factor in lack of literacy in mathematics, one example of the use of mathematical literacy in everyday life is, when shopping at a store, we are often faced with several choices of goods. Some of them may have discounts or bonuses in the form of vouchers or others. By considering a more economical price, so it can be more profitable. This shows that mathematical literacy is not only in mastering the material in class, but also in the use of mathematical facts, concepts, and procedures in solving everyday problems,(Firdaus & Rustina, 2019) but the story questions listed in the Pre-Test questions are so long, so they have difficulty reading them and they only read them briefly.

3.1. Three Variable Equation System

The results of the Pre-Test showed that 0% of students were able to answer correctly the questions related to the system of equations of three variables. This difficulty reflects a lack of understanding of basic concepts such as substitution and elimination methods. Many students could not understand how to relate three variables into one unit, which is very important in the context of real applications. One of the main causes of this result is caused by:

a. Lack of Practice: Students do not get enough practice in solving systems of equations.

b. Less Effective Teaching Methods: The approach used in teaching may not be able to explain concepts in a way that is easy to understand.

3.2. Exponential Function

In the exponential function analysis, the results showed that most students also experienced difficulties, with many getting 0% marks. Even though there is a basic

understanding of exponential functions, errors occur in graphing and understanding the properties of these functions. Contributing factors include:

a. Lack of Application Context: Students may not see how exponential functions relate to real life situations, making them less interested.

b. Lack of Visual Aids: Without adequate visual aids, students will have difficulty understanding these complex concepts

Exponential functions are special mathematical material related to exponential function material taught at Senior High School Level X (SMA). It was found that students made many mistakes when solving problems related to exponential functions. These are errors in understanding both the concept of exponential functions and the elements of exponential functions and their relationships, errors in converting problems into mathematical models, and errors in making conclusions. Based on the explanation above, it can be understood that for professional students in solving mathematical problems on exponential material, mathematics learning is very short in understanding and solving mathematical problems. (Marlan et al., 2023)

3.4. Expansion

On the expansion topic, the results also showed 0% of students managed to answer correctly. This suggests that many students do not understand the basic concept of expansion, which is often related to other topics in mathematics. The main causes include:

a. Lack of Linkage: Students cannot relate expansion to other topics, making it difficult for them to understand the concept.

b. Less interesting learning approach: Kurangnya variasi dalam metode pengajaran dapat menyebabkan kebosanan dan kurangnya motivasi pelajar.

3.5. Strategy for Increasing Efficacy

To improve students' mathematical literacy efforts, the following steps can be taken:

a. Application of Interactive Learning Methods: Using learning methods that involve active student participation, such as group discussions and project-based problem solving.

b. Increased Use of Visual Aids: Utilize graphs, models, and mathematical software to help students understand complex concepts.

c. Contextualization of Learning: Relate learning material to real situations to increase student interest and understanding.

d. Guidance and Remedial Program: Providing additional guidance programs for students who experience difficulties, as well as remediation for those who get low grades.

The competencies expected in the AKM Pre-Test for campus teaching classes, after studying mathematics in basic education and secondary education as stated in the SMA/MA subject syllabus model are (1) Understanding concepts and applying

mathematical procedures in everyday life (2) Generalizing Creating patterns, facts, phenomena, or data based on existing things; (3) Carrying out mathematical operations (4) engaging in mathematical reasoning, including making and testing inferences, and (5) solving problems and communicating ideas using symbols to clarify situations and problems, tables, diagrams, or other media (6) Developing positive attitudes such as thinking logically, critically, being alert, and not giving up easily in solving problems. The six competency points above that are expected after learning mathematics are one way to improve the quality of students' mathematics learning. (Intan et al., 2020)

The Minimum Competency Assessment (AKM) is an assessment of the fundamental competencies that all students need to be able to develop their own capacity and participate positively in society. There are two fundamental competencies measured by AKM, namely reading literacy and numeracy.(Fauziah et al., 2021) The assessments in this AKM are collected into 2 categories including Literacy and Numeracy. Numeracy is a type of literacy in the field of mathematics. Numeracy is the ability to think using concepts, procedures, facts and mathematical tools to solve everyday problems in various types of contexts that are relevant for individuals as citizens of Indonesia and the world. (Sari et al., 2021a) The use of context in AKM Numeracy is used to recognize the role of mathematics in everyday life. Students with high mathematical abilities are able to use various kinds of numbers or symbols related to basic mathematics to solve mathematical problems, are able to analyze information in the form of graphs, tables, charts and others and are able to use this information in solving problems (Indra & Rahadyan, 2021)

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3.6. Subtopics

The AKM Pre-Test class from this campus teaching program got slightly less satisfactory results, out of 20 mathematics questions and consisting of story form questions, only 17 questions had a percentage that was not 0%, here are the percentage results of the 3 whose results were 0% so that the material needed to be improved (system of linear equations with three variables, exponential function and the use of mean, median and mode in problem solving *expansion*).

Question Form	Competence	Number of students	Number of students responding Correct	Percentage of students responding Correct
Complex Multiple Choice	Solve problems related to systems of three linear equations variable.	34	17	50%

Question Form	Competence	Number of students	Number of students responding Correct	Percentage of students responding Correct
Multiple choice	Solve problems related to systems of three linear equations variable.	34	2	6%
Matching	Resolve related problems with a three-variable linear equation system.	34	0	0%
Multiple choice	Using the exponential function	34	1	3%
Complex Multiple choice	Using the exponential function	34	2	6%
True or false	Using the exponential function	34	5	15%
Matching	Using the exponential function	34	0	0%
Complex multiple choice	Operations on integers or numbers to whole powers (EXTENSION)	34	16	47%
Multiple choice	Operations on integers or numbers to whole powers (EXTENSION)	34	12	35%
Maching	Operations on integers or numbers to whole powers (EXTENSION)	34	19	56%
Complex multiple choice	Operations on integers or numbers to whole powers (EXTENSION)	34	16	47%
True or false	Operations on integers or numbers to whole powers (EXTENSION)	34	4	12%
Multiple choice	Determining and using the mean, median, and mode in problem solving. (EXPANSION)	34	8	24%
Complex multiple choice	Determining and using mean, median, and mode in problem solving (EXTENSION)	34	12	35%
Matching	Determining and using the mean, median, and mode in	34	0	0%

Question Form	Competence	Number of students	Number of students responding Correct	Percentage of students responding Correct
	problem solving. (EXPANSION)			
Complex mutiple choice	Using the concepts of similarity and congruence	34	23	68%
Matching	Using the concepts of similarity and congruence	34	3	9%
Multiple choice	Recognize and use standard units for volume (cm3, m3, liter), speed, and flow (EXTENSION)	34	11	32%
Matching	Calculate and estimate the volume and surface area of prisms, cylinders, pyramids, cones, spheres and their combinations	34	4	12%
Complex multiple choice	Calculate and estimate the volume and surface area of prisms, cylinders, pyramids, cones, spheres and their combinations.	34	14	41%

In this way, it is important to train students' basic numeracy skills from elementary school to prepare the nation's next generation in the future for the nation's progress in an increasingly sophisticated era. One of the basic knowledge that must be mastered to be able to compete in this technological era is mathematics. When someone is able to master numeracy knowledge well then he is able to master mathematics. (Wahyu Adinda et al., 2022)

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4. Conclusions

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this research can make a positive contribution to the development of mathematical literacy among vocational school students, as well as become a basis for further research in the future.

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